

What is claimed is:

1. A ribboned polarization-maintaining fiber comprising a plurality of polarization-maintaining fibers,

5 wherein a ribbon portion having a length of 2 to 300 mm is formed in at least some of polarization-maintaining fibers.

2. The ribboned polarization-maintaining fiber according to claim 1,

10 wherein said ribbon portion is one formed by fixing and coating said polarization-maintaining fibers with an adhesive, and aligning end faces of said polarization-maintaining fibers which are used at least as a signal so as to become a predetermined plane of polarization.

15 3. The ribboned polarization-maintaining fiber according to claim 1,

wherein said ribbon portion is provided with a positioning means.

4. The ribboned polarization-maintaining fiber according to claim 3,

20 wherein said positioning means is formed as a series of convex and concave shapes.

5. The ribboned polarization-maintaining fiber according to claim 4,

wherein said convex and concave shapes are disposed at a regular pitch or discontinuously.

5 6. The ribboned polarization-maintaining fiber according to claim 5,

wherein said convex and concave shapes are formed as a saw tooth shape or a curved wavy shape.

7. A manufacturing method for a ribboned polarization-maintaining fiber, which comprises steps of

10 aligning a plurality of polarization-maintaining fibers with a precise pitch width while adjusting rotationally end faces of polarization-maintaining fibers so as to form a predetermined plane of polarization, and

15 fixing and coating a part of thus aligned polarization-maintaining fibers with an adhesive so as to form a ribbon portion.

8. A manufacturing method for a ribboned polarization-maintaining fiber, which comprises steps of

20 preparing a ribbon-making jig consisting of an upper mold and a lower mold both of which have a ribbon-making groove for making a ribbon of a plurality of polarization-maintaining fibers,

aligning a plurality of polarization-maintaining fibers in a V-groove portion provided at both ends of the ribbon-making groove of said lower mold while adjusting rotationally end faces of the polarization-maintaining  
5 fibers so as to form a predetermined plane of polarization,

thereafter pouring an adhesive into a frame formed by the ribbon-making grooves of said upper and lower molds and curing thus poured adhesive to form a ribbon portion on some of polarization-maintaining fibers, and

10 subsequently removing said upper and lower molds to obtain a ribboned polarization-maintaining fiber.

9. A manufacturing method for a ribboned polarization-maintaining fiber, which comprises steps of

preparing a ribbon-making jig consisting of an upper  
15 mold, and a lower mold having a ribbon-making groove for making a ribbon of a plurality of polarization-maintaining fibers and a plurality of V-shaped grooves provided at both ends of the ribbon-making groove,

placing a plurality of polarization-maintaining fibers  
20 in said V-groove portions of said lower mold,

fixing temporarily thus placed polarization-maintaining fibers by placing said upper mold at both ends of said lower mold,

thereafter coating thus aligned fibers with an adhesive  
25 by adding an adhesive onto said ribbon-making groove of said lower mold,

aligning said polarization-maintaining fibers while rotationally adjusting end faces of them so as to form a predetermined plane of polarization,

5 curing thus applied adhesive to form a ribbon portion on some of polarization-maintaining fibers, and subsequently removing said upper molds and said lower mold to obtain a ribboned polarization-maintaining fiber.

10 10. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 7, which comprises further a step of

coating a portion in which said polarization-maintaining fibers come into contact with each other with an adhesive during the step of rotationally adjusting the end faces of said polarization-maintaining fibers.

15 11. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 8, which comprises further a step of

20 coating a portion in which said polarization-maintaining fibers come into contact with each other with an adhesive during the step of rotationally adjusting the end faces of said polarization-maintaining fibers.

12. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 9, which comprises further a step of

coating a portion in which said polarization-maintaining fibers come into contact with each other with an adhesive during the step of rotationally adjusting the end faces of said polarization-maintaining fibers.

5 13. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 7, wherein said adhesive has a viscosity of 10000 cP or lower.

10 14. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 8, wherein said adhesive has a viscosity of 10000 cP or lower.

15 15. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 9, wherein said adhesive has a viscosity of 10000 cP or lower.

16. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 7, wherein said adhesive is a urethane acrylate resin.

20 17. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 8, wherein said adhesive is a urethane acrylate resin.

18. The manufacturing method for a ribboned polarization-maintaining fiber according to claim 9, wherein said adhesive is a urethane acrylate resin.

19. A ribbon-making jig, comprising:

5 a lower mold having a ribbon-making groove for fixing and coating polarization-maintaining fibers aligned previously by and/or with an adhesive, and V-groove portions provided at both ends of said ribbon-making groove to align said polarization-maintaining fibers; and

10 an upper mold having a ribbon-making groove provided symmetrically with the ribbon-making groove in said lower mold, and an adhesive in-flow portion for supplying an adhesive into said ribbon-making groove; said portion being formed in a central portion of said ribbon-making groove.

15 20. A polarization-maintaining optical fiber array made of a ribboned polarization-maintaining fiber according to claim 1.